Remarks

Claims 1-7 are pending in the application. Claims 8-13 are new. Claims 1-7 are rejected. Claims 2 and 3 are objected to. The Drawings are objected to. All rejections and objections are respectfully traversed.

The specification has been amended to include step 115 as shown in Figure 1.

Claims 2 and 3 have been amended to specify dependencies.

The claims have been amended to embedd the method steps in a computer system and machine-readable medium including a computer executable program to overcome the 35 U.S.C. 101 rejection.

Claim 1 has been amended to provide antecedent basis for "the priority algorithm" in claims 2 and 3. Claim 6 has been amended to properly claim the decision vector.

Claims 1 and 6 are rejected under 35 U.S.C. 103(e) as being unpatentable over AAPA in view of Beygelzimer et al. (U.S. Patent Application Publication No. 2002/0161736).

Beygelzimer maps a discrete ordering problem to a continuous optimization problem, solves the continuous optimization problem, and maps an optimal continuous solution to a closest discrete solution. The continuous

optimization problem models data as a sparse heterogeneous graph with vertices being categorical values to be ordered. This converts the optimization problem to a graph partitioning problem. Paragraph 37 describes how the graph is approximated by a sequence of smaller, coarser graphs. The coarsest graph is ordered, and the resulting order is then propagated back to the original graph by interpolating through the sequence of intermediate graphs.

Paragraph 64 describes how the ordering is performed with a spectral algorithm, and paragraph 65 describes the propagation of the order in the sequence of graphs. Paragraph 66 describes the refinement of the coarse graph.

With all due respect, the Examiner's reasoning does not reveal the relationship between the claimed elements of the optimization problem and the graphs in Beygelzimer. The Beygelzimer re-ordering operates in a continuous space.

At paragraph 34, Beygelzimer states:

> **[0034]** We will illustrate, in embodiments below, that the continuous optimization that we formulate has a special structure that makes it tractable, although the original discrete problem is NP-hard. This enables us to develop a spectral algorithm that gives the optimal solution. For instance, our algorithm uses spectral (algebraic) information

Beygelzimer does not describe the modifying of the ordering of the same set of elements repeated to produce a re-ordering of the elements. The Examiner also does not state what a spectral algorithm has to do with the claimed combinatorial optimization problem.

Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Beygelzimer et al. (U.S. Patent Application Publication No. 2002/0161736), and further in view of Angelopoulos et al. ("On the Power of Priority Algorithms for Facility Location and Set Cover," APPROX, pp. 26-39, 2002).

For the reasons stated above, the AAPA does not teach claim 1. Furthermore, Angelopoulos does not cure the defects of the AAPA as modified. Therefore, the combination of AAPA, Beygelzimer and Angelopoulos cannot render the claimed invention obvious.

Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Beygelzimer et al. (U.S. Patent Application Publication No. 2002/0161736), and further in view of Krishnan et al. (U.S. Patent Application Publication No. 2003/0051165).

Krishnan has nothing to do with combinatorial optimization problems. Krishnan discloses a packet data filter which stores ordered rules and sequentially applies the rules to received data packets to determine the disposition of the data packet. Krishnan can not be combined with the AAPA. The disclosed re-ordering of Krishnan is nothing but a well-known bubble sort.

There is nothing in Krishnan that teaches a re-ordering within a predetermined distance of a previous ordering. Bubble sorts do not use

distance metrics. Specifically, the Krishnan algorithm attempts to move the rules with *a higher match count* earlier in the sequence of rules. One constraint of the re-ordering of rules is that rules are only swapped if doing so will not change the overall security policy of the rule set.

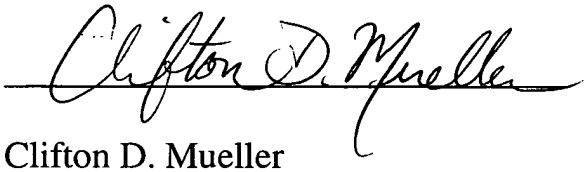
As the Examiner states, the Krishnan re-ordering is to

enable a quicker, better-performing operation

The object of the invention is to obtain an optimal solution to combinatorial optimization problems.

It is believed that this application is now in condition for allowance. A notice to this effect is respectfully requested. Should further questions arise concerning this application, the Examiner is invited to call Applicant's agent at the number listed below. Please charge any shortage in fees due in connection with the filing of this paper to Deposit Account 50-0749.

Respectfully submitted,
Mitsubishi Electric Research Laboratories, Inc.

By 

Clifton D. Mueller
Agent for the Assignee
Reg. No. 57,836

201 Broadway, 8th Floor
Cambridge, MA 02139
Telephone: (617) 621-7517
Customer No. 022199